

# **DRAFT DECISION NOTICE AND FINDING OF NO SIGNIFICANT IMPACT GLACIER PEAK SEISMIC MONITORING PROJECT LOCATED WITHIN THE GLACIER PEAK WILDERNESS**

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Mt. Baker-Snoqualmie National Forest  
Darrington Ranger District  
Snohomish County, Washington**

## **INTRODUCTION**

Glacier Peak is a potentially active volcano near popular recreation areas as well as the communities of Darrington, Arlington, Stanwood, Concrete, Sedro Woolley and Mt. Vernon. As a potentially active volcano, Glacier Peak poses significant volcanic, landslide, flood, channel migration, and earthquake hazards to recreationists within the Glacier Peak Wilderness area, as well as to nearby communities and community assets (Ewert et al. 2005). The Mt. Baker-Snoqualmie National Forest (Forest), therefore, is proposing to install volcanic monitoring stations in the Glacier Peak Wilderness. This proposal is based on the special use application submitted by the U.S. Geological Survey–Cascades Volcano Observatory (USGS–CVO) as part of its mandate to mitigate volcanic hazards; this proposal recommends installing and maintaining four new volcanic monitoring stations on the flanks of Glacier Peak and upgrading an existing site. The stations would be assembled, installed, and maintained by the USGS–CVO. The data gathered would be used to assess volcanic activity and provide critical information for the safety of wilderness users and others during volcanic unrest.

## **Volcanic Threat**

In 2005, the USGS identified Glacier Peak as a very high-threat volcano in a report titled *An Assessment of Volcanic Threat and Monitoring Capabilities in the United States: Framework for a National Volcanic Early Warning System* (Ewert et al. 2005). In this report, the volcanic threat (a combination of hazard and exposure) was assessed for all United States volcanoes considered to have the potential to erupt again. Overall threat scores for each volcano were determined by assigning numerical values to various hazard and exposure factors.

This high score was due to a number of factors, including:

- 1) Volcano type and maximum volcanic explosivity index;
- 2) Glacier Peak's significant lahar-generation potential;
- 3) the number of people living within approximately 19 miles (30 kilometers) of Glacier Peak, including the number of daily visitors recreating on and near the volcano in the Glacier Peak Wilderness;
- 4) the number of people living in Glacier Peak lahar hazard zones beyond approximately 19 miles;
- 5) regional and local aviation exposure.

Given the well-documented hazards posed by volcanoes, continuous robust monitoring is critical for public safety and hazard mitigation. Early detection of unrest at Glacier Peak is particularly critical given the popularity of Glacier Peak's backcountry areas and the exposure of those users to near-field volcanic hazards (e.g., ejecta, pyroclastic flows, lahars) that can impact areas close to the volcano within 30 minutes or less of the start of an eruption or explosion. Recent eruptions in Alaska (Okmok, 2008; Larsen et al. 2009), Chile (Calbuco volcano, 2015; Van Eaton et al. 2016), and Japan (Ontake volcano, 2014; Kato et al. 2015) have demonstrated that volcanoes can transition rapidly from a state of quiescence to eruption with as little as a few hours, or in rare cases even a few minutes, of warning. If adequate systems are not in place and Glacier Peak were to wake up quickly, it is possible that warning signs of an impending eruption could be missed, putting the lives of wilderness users and others in danger. The most common precursors to volcanic activity are surface deformation, increases in volcanic gasses emitted from a volcano, and increases in earthquakes.

## **PURPOSE AND NEED FOR ACTION**

The USGS has the Federal responsibility to provide notifications and warnings for earthquakes, volcanoes, and landslides to the affected populace and civil authorities. To address the volcanic hazards posed by Glacier Peak to Wilderness users, as well as populations living in vulnerable areas, the USGS-CVO proposes installing and maintaining four new volcanic monitoring stations and one systems upgrade at an existing station on the flanks of Glacier Peak, all located within the Glacier Peak Wilderness. The proposed monitoring stations are intended to provide USGS scientists with real-time early and adequate warnings of any changes in seismicity and ground deformation that may signal an increase in volcanic activity at Glacier Peak. The USGS designated Glacier Peak as a very high threat volcano in the 2005 report titled, "An Assessment of Volcanic Threat and Monitoring Capabilities in the United States: Framework for a National Volcanic Early Warning System" (Ewert et al. 2005).

With only one seismometer currently operating near Glacier Peak, the USGS-CVO has identified that there is a need for a more robust seismic monitoring of the mountain for the purposes of detection and accurate location of small magnitude earthquakes and other seismic signals.

As such, the primary purpose of the project is to fill gaps in the monitoring network at Glacier Peak. These stations enhance the ability to detect subtle signals beneath the volcano that indicate unrest, earlier and with greater confidence than current capabilities. Another purpose is to gather the data needed to help ensure the safety of both the adjacent communities, as well as recreationists using the wilderness and the general forest.

A 2008 USGS report (Moran et al., 2008) describes the scientific rationale for different types of monitoring equipment on volcanoes and the numbers of sensors required for adequate volcano monitoring. According to instrumentation recommendations from this report, Glacier Peak is significantly under-monitored relative to the risk it poses to Wilderness users and nearby communities.

There are two types of monitoring gaps at Glacier Peak:

1. The first gap is the ability to detect surface deformation of the Earth's surface. Surface deformation occurs as magma moves upwards towards the surface, into the magmatic system and pushing aside rock in the process. Magma-caused surface deformation can be very subtle (on the order of centimeters) and not visible to the naked eye or detectable from space, particularly in the

early stages of unrest. Reliable detection of magma-caused deformation at Glacier Peak requires high-precision real-time continuously operating Global Positioning System (GPS) monitoring stations that are anchored into the ground. At present there is just one GPS station near Glacier Peak (GPW station at Scimitar Glacier). This single station is insufficient for reliable detection of deformation at Glacier Peak because deformation trends from a single station can't be relied upon, since they can be caused by non-magmatic processes such as antenna icing, diurnal changes in temperature, and site instability. In addition, one station is insufficient for locating the deformation source, an important capability for assessing whether magma is rising and for assessing slope stability at the surface. The proposed action by the USGS would add 4 new GPS stations to the Glacier Peak monitoring network, which would significantly improve surface-deformation-monitoring capabilities at Glacier Peak.

2. The second gap is the ability to detect and precisely locate small earthquakes at Glacier Peak. For magma to rise to the surface, a pathway must be created; such a process involves breaking of rock, which in turn creates earthquakes, many of which are very small (magnitude < 1.0). Such seismicity is often the earliest form of unrest to occur before an eruption and detecting and precisely locating small earthquakes is critical for determining the timing and location of an eruption. Because Wilderness users are a constant presence at Glacier Peak, it is important that USGS scientists be able to detect small earthquakes and determine whether they are moving closer to the surface. At present there is only one seismic station in operation near Glacier Peak. Additional seismic stations are needed within 4 miles of the volcano to enable reliable detection and precise location of small earthquakes. The proposed action by the USGS would add 4 new seismic stations (co-located with the 4 proposed GPS stations) close to the volcano; along with upgrading the existing seismic station. The USGS estimates that these additional stations would result in an 8-fold increase in the number of earthquakes that could be detected and precisely located at Glacier Peak.

USGS-CVO has demonstrated that these monitoring stations cannot be located outside of wilderness and obtain adequate data (see EA, section 2.5 for more information).

## **DRAFT DECISION AND REASONS FOR THE DECISION**

Recent reports assessed the level of monitoring in the Cascades and concluded that most Cascade volcanoes are under-monitored, given the threats they pose to life and infrastructure (Ewert et al. 2005 and Moran et al. 2008a). This includes Glacier Peak volcano. USGS has determined that the number and type of monitoring stations close to the summit is inadequate (Ewert et al. 2005). Using this classification and existing circumstances, the USGS recommends that Glacier Peak be monitored at the highest of four monitoring levels. Based on this information and a review of all alternatives, I have decided to implement Alternative B, the proposed action. My selected action includes installing four monitoring stations and upgrading an existing station within the Glacier Peak Wilderness, as described in detail in the EA, Section 2.2. The selected alternative is described in more detail in the following sections.

### **Details of the Selected Alternative**

The monitoring stations would consist of four co-located seismic and GPS stations, and one system upgrade at an existing site. The locations for each station are listed in **Error! Reference source not found.** and shown in **Error! Reference source not found.**. The seismometers detect background and elevated seismic activity on the volcano. Having sufficient seismometers

strategically located on and around the volcano allows for the detection and accurate location of small magnitude earthquakes and other seismic signals. Analysis of these data is used to determine if a volcano is reawakening while magma is still several miles below the summit. Additionally, seismic data aid in forecasting the likely onset time and style of eruptive activity.

Each station provides continuous integrated real time data that is transmitted in real time. The data captured is used to monitor and interpret both long- and short-term seismic behavior and ground deformation of the volcano. This equipment is able to measure both small and large scale ground deformation. It is designed to last for decades and allow for new generation monitoring equipment to be installed without further modification of the stations or an increase in size or footprint. The USGS intends to monitor these sites for a minimum of 30 years.

**Table 1. Proposed USGS volcanic monitoring stations**

<b>Name</b>	<b>Type</b>	<b>Township</b>
Glacier Basin (GP01)	Combined Seismic/GPS	30N, 14E, Section 29
Miners Ridge (GP02)	Combined Seismic/GPS	31N, 15E, Section 7
Zilob Peak (GP03)	Combined Seismic/GPS	30N, 12E, Section 5
Glacier Peak East (GP04)	Combined Seismic/GPS	30N, 14E, Section 11
Scimitar Glacier (GPW)	Combined Seismic/GPS	30N, 14E, Section 8

The combined seismic and GPS (global positioning system) stations would each include a seismometer, 10 sealed batteries inside a small fiberglass enclosure, solar panels mounted on the enclosure, a GPS antenna and mast mounted in bedrock, and a data telemetry antenna mounted on the enclosure walls (figure 2). The data telemetry antenna at Miners Ridge will be attached to the lookout tower.

After driving to the nearest trailhead, the sites would be reached by foot travel. This is the preferred access method and would be used by all USGS personnel and others when accessing the sites for construction and maintenance. A helicopter would be needed during installation for the five seismic monitoring stations, given the size and weight of the equipment (1,900 lbs.). Table 2 below has more information on the weight for each monitoring station. A helicopter would deliver external sling loads of equipment, tools, and materials to and from each site during construction. The number of trips with the helicopters would be minimized as much as possible. All maintenance activities, not including battery replacement, would be completed without the use of helicopters. Battery replacements would be flown to each site every 3-5 years. See EA, Section 2-4: Wilderness Act Consistency for more details on helicopter use.

**Table 2. Weight of materials to be transported for each monitoring station**

<b>Materials</b>	<b>Weight in pounds</b>
Fiberglass hut mounted with 4 solar panels to recharge the batteries	500
10 lead acid batteries, 70 pounds each	700
Instruments (dual frequency GPS, radio, coax, conduit, wire, seismic)	200

Materials	Weight in pounds
Solar panels	100
Concrete, including water	400
Total weight for each installation	1,900

Figure 1. Map of USGS volcanic monitoring sites

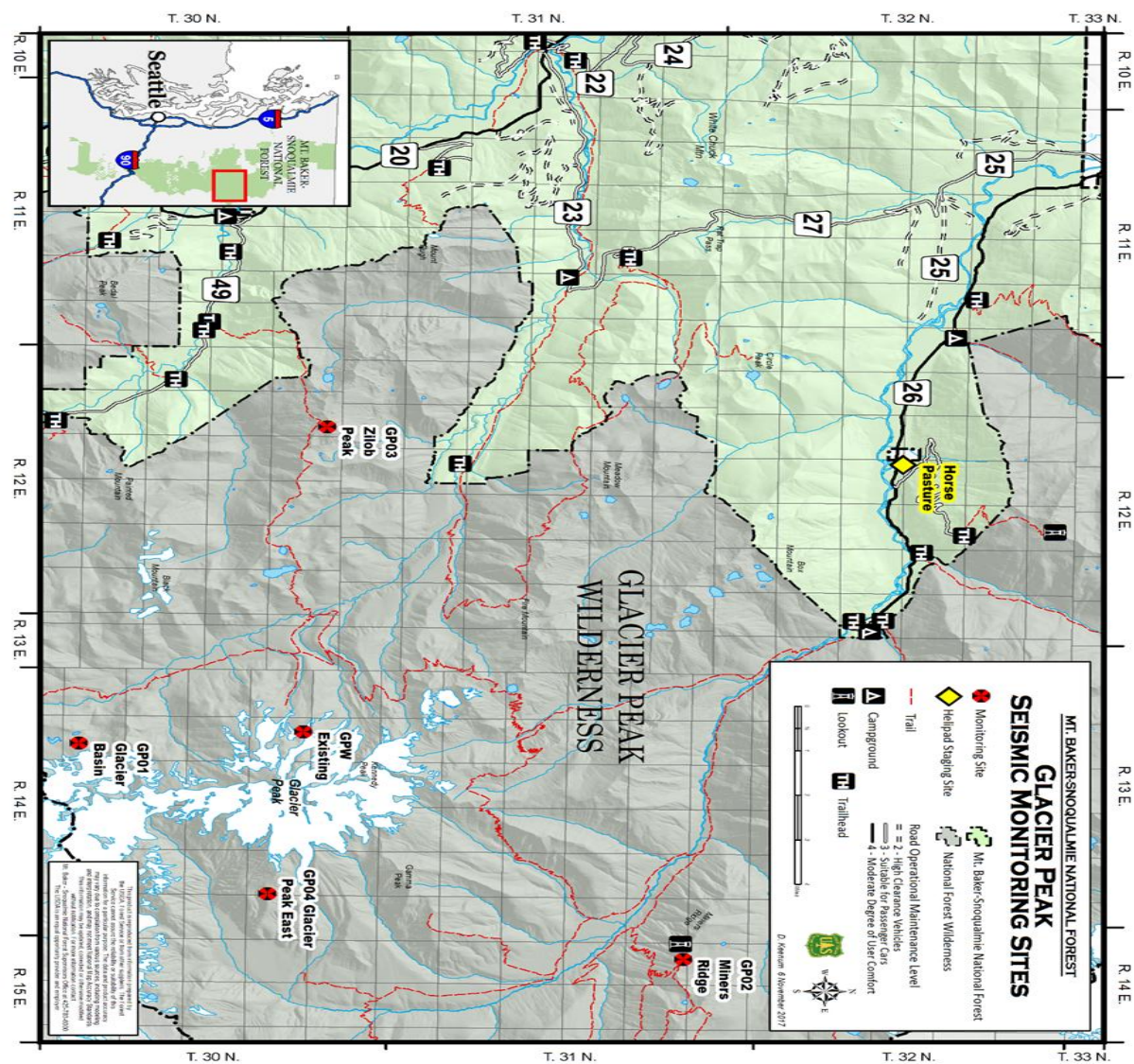
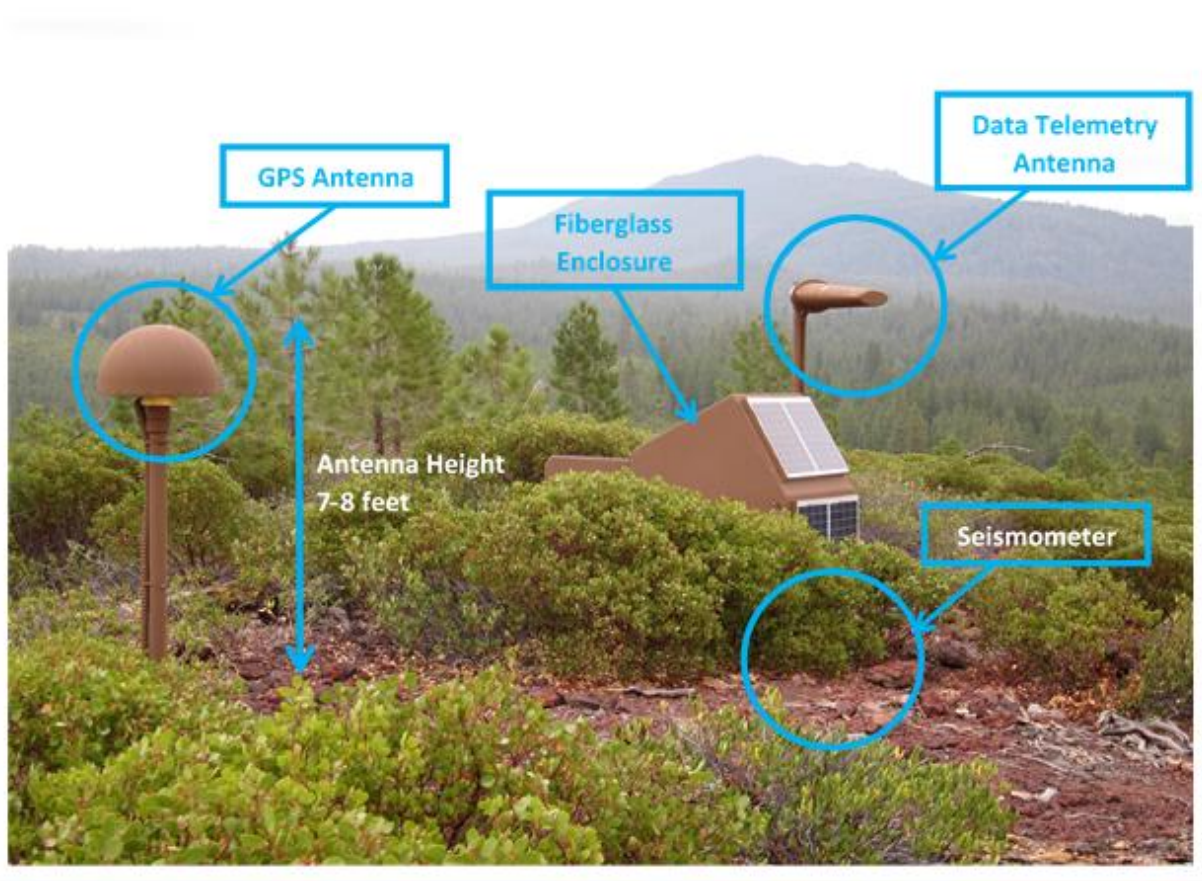


Figure 2. Example of fiberglass enclosure station with external GPS antenna



## PROJECT DESIGN CRITERIA

The following project design criteria, BMPs, and mitigations measures are an integral part of the project and are required during the implementation of this project.

### Botany

B-1: If any previously undiscovered TES or other rare or uncommon vascular plant, bryophyte, lichen, or fungus is discovered, before or during project implementation, halt work until a USFS botanist is consulted and necessary mitigation measures are enacted.

B-2: Treat known infestations of high priority invasive plants *before* ground disturbance begins. To be effective a lag time of 2 weeks is needed between the time of treatment and the time of ground disturbance.

B-3: Actions conducted or authorized by the FS that would operate outside the limits of the road prism require the cleaning of all equipment prior to entering NFS lands.

B-4: Suppliers must provide documentation indicating that the following products have been examined by a qualified inspector and deemed free of State listed noxious weeds: straw, mulch, gravel, rock, other fill, or seeds.

B-5: If weeds are present in the project area, all equipment and gear must be cleaned before leaving the project area to avoid spreading the infestation further.

B-6: If weeds are present in the project area, work from relatively weed-free areas into the infested area rather than vice versa.

B-7: For Washington State Class A and B designate noxious weeds: treat with the most effective method; after treatment has taken effect, cover the infestation with geotextile fabric to avoid spreading seed or roots remaining in the soil. Avoid disturbance to area. If disturbance cannot be avoided, treat infestation first, then wash equipment after working in the infested area before moving into an area not infested.

### **Heritage and Cultural Resources**

HC-1: If cultural items specified in the Native American Graves, Protection and Repatriation Act are discovered, or if human remains are determined to be Native American and non-forensic, the Forest Service will take jurisdiction and ensure that the Forest's NAGPRA protocol is followed, pursuant to the regulations at 43 CFR 10.

HC-2: If a previously unidentified cultural resource is discovered during implementation, the activity shall be stopped in the area of the find, and a reasonable effort to secure and protect the resource made. The Forest Heritage Specialist shall be notified, and the Forest would fulfill its responsibilities in accordance with the Programmatic Agreement and other applicable regulations.

### **Recreation & Wilderness**

RW-1: Flights on weekends and holidays should be avoided to reduce potential impacts to visitors.

RW-2: Post information about the project at trailheads leading to the staging or access to the installation sites.

RW-3: Post details, including timing, of the project on the Mt. Baker-Snoqualmie website.

RW-4: Limit trail and road closures as much as practicable (avoid multiple closures at once and limit duration of closures to only length of time necessary for operations).

RW-5: Limit operations to one site at a time so that only one location would be affected by helicopter disturbance at any given time.

RW-6: All installation debris needs to be removed from the sites.

### **Soil, Water, and Fisheries**

SWF1 - All implementation would be completed when conditions are dry. At each location only 30 square feet would be affected; 25 square feet of this area would consist of a box being installed, concreted into place. All affected material from burying seismometer would be stabilized on site by refilling the hole with the same material.

SWF2 - Equipment staging and refueling activities for use of the helicopter would only occur at Green Mountain Pasture (NE ¼, NE ¼, Section 20, T32N, R12E, WM). This proposed staging area is located on existing roads and outside of the Glacier Peak Wilderness. Roads BMPs Road-9 and Road-10 apply (included below) as a staging area would be used and refueling activities may be needed for project implementation.

SWF3 - Ground disturbing activities under this special use permit would only occur for the construction and maintenance of the monitoring sites. All site specific BMPs within this

document would be included in Special Use Permit authorizing USGS to implement and use the sites identified.

SWF4 - Establish a Spill Prevention Control and Containment Plan (SPCCP) and maintain a spill remediation kit on-site for any fuel stored on NFS lands in association with this project. Fuels stored on NFS lands shall be 100 feet or more from aquatic resources.

SWF5 - Refueling truck shall be kept and operated in a petroleum containment basin with 150% of the refueling trucks fuel capacity. All petroleum products would be secured in self-contained safety cans.

## **Visuals**

V-1: Retain and keep in-tack trees, vegetation, soils, and rocks as much as reasonably possible, adjacent to resulting ground disturbed during installation of new seismic station elements.

V-2: Once new seismic station elements are installed and in-place, the replacement of disturbed and unearthed soil and rock should be graded and arranged in a way that the surface appears natural regarding grade, slope, and the clustering of rocks verses soil and vegetation.

V-3: All new seismic station elements that are to be installed adjacent to existing Forest Service administrative structures, such as; Miner's Ridge Lookout and Lost Creek Ridge radio repeater, should be painted to match the existing Forest Service administrative equipment. If this is not possible the new seismic station elements should be painted dark browns or blue-gray. Paint should have a matte finish.

## **Wildlife**

WL-1: Heavy equipment and other activities generating noise above ambient levels within suitable nesting habitat for spotted owls and marbled murrelets would be scheduled for outside of the breeding season when not in conflict with other operational constraints.

WL-2: Heavy equipment and other activities generating noise above ambient levels and occurring between April 1 and September 15 would occur between two hours after sunrise to two hours before sunset.

WL-3: If raptor nest sites are found within the project area during implementation, activities will stop and a Forest Service Wildlife Biologist will be consulted. At the biologist's discretion protective buffers and/or seasonal operation restrictions (March 15<sup>th</sup> to August 3<sup>rd</sup>) may be assigned to newly located active nest sites.

WL-4: Garbage containing food and trash generated by workers will be handled as per wilderness guidelines or removed daily.

The USGS is responsible for installing and maintaining all equipment. Construction is typically completed in two to three days per site but could last as long as one week depending on site conditions and weather.

The Forest Service will amend the USGS special use permit to incorporate these additional sites and develop an operating plan for the volcanic monitoring sites within Glacier Peak Wilderness. It is anticipated that a 20-year special use permit will be issued, and that the USGS could apply for the permit to be reissued. A Forest Service special use permit administrator would monitor project implementation along with compliance with all permit terms and conditions.

## **RATIONALE FOR THIS DECISION**

When compared to the other alternatives, I believe that the proposed action represents a balanced approach to achieving the purpose and need for action, providing improved response time to protect wilderness users and adjacent communities, while being consistent with the Wilderness Act and minimizing impacts to the qualities of wilderness character. My decision is based on a thorough review of the environmental assessment and supporting documentation, and consideration of how well each alternative achieves the purpose and need for the project. I have also considered all comments received throughout the planning process and feel that the selected alternative fully considered the opinions and comments received from all stakeholders throughout the process. My decision would implement the minimum requirements needed for the administration of the area as wilderness to provide an adequate early warning system for wilderness visitors and surrounding communities, as detailed in the Volcanic Monitoring in the Glacier Peak Wilderness, Minimum Requirements Analysis.

## **IMPROVED MONITORING NETWORK**

It is important to me to protect the health and safety of the wilderness users and surrounding communities. I do not believe that I can achieve this without implementing the proposed action. As previously discussed, Glacier Peak is a long-lived volcanic center that has erupted recurrently during the past 500,000 years. Today, Glacier Peak continues to show signs that it is an active volcano with potential to erupt again. The proposed five monitoring stations would fill several types of volcanic monitoring gaps, described below. Filling these monitoring gaps would significantly improve scientists' ability to detect subtle signs of unrest beneath the volcano earlier and with greater confidence than current capabilities.

The first gap is the ability to detect surface deformation. Surface deformation occurs as magma moves upward toward the surface, pushing aside rock in the process to make room. Magma-caused surface deformation can be very subtle (on the order of centimeters) and not visible to the naked eye or detectable from space, particularly in the early stages of unrest. Reliable detection of magma-caused deformation at Glacier Peak requires high-precision, real-time, and continuously operating GPS monitoring stations that are anchored into the ground. At present there is only one GPS station near Glacier Peak (Scimitar Glacier, approximately 1.5 miles from the summit). This single station is insufficient for reliable detection of deformation at Glacier Peak because:

- 1) deformation trends from a single station cannot be relied upon, since they can be caused by non-magmatic processes such as antenna icing, diurnal changes in temperature, and site instability; and,
- 2) a single station is insufficient for locating the deformation source, an important capability for assessing whether magma is rising and for assessing slope stability at the surface.

The proposed action would add four new GPS stations and one system upgrade to the Glacier Peak monitoring network, which would significantly improve surface-deformation-monitoring capabilities at the volcano.

The second gap is the ability to detect and precisely locate small earthquakes at Glacier Peak. For magma to rise to the surface, a pathway must be created; such a process involves breaking of rock, which in turn creates earthquakes, many of which are very small (magnitude < 1.0). Such seismicity is often the earliest form of unrest to occur before an eruption and detecting and

precisely locating small earthquakes is critical for determining the timing and location of an eruption. It is important that scientists be able to detect small earthquakes and determine whether they are moving closer to the surface. At present, there is only one seismic station in operation near Glacier Peak. Additional seismic stations are needed within four miles of the volcano to enable reliable detection and precise location of small earthquakes. The proposed action would add four new seismic stations (co-located with the four proposed GPS stations) and would upgrade one existing station close to the volcano. These additional stations would result in an eight-fold increase in the number of earthquakes that could be detected and precisely located at Glacier Peak.

Each of these monitoring gaps creates a significant blind spot in the present-day monitoring network's ability to detect early signs of unrest; these blind spots substantially increase the risk to wilderness users and communities near Glacier Peak by not receiving timely warnings. As one example, this is illustrated by the onset of unrest associated with the 2004–2008 eruption of Mount St. Helens. Prior to the eruption there was a 13-station seismic network at Mount St. Helens; however, there was just one operational continuous telemetered GPS station that was located five miles from the volcano (Lisowski et al. 2008). Therefore, when an earthquake swarm of small (mostly magnitude < 1.0 earthquakes) began on September 23, 2004, the seismic network was up to the task of detecting and locating events; however, due to the blind spot created by not having a continuous GPS station close to Mount St. Helens, the USGS-CVO scientists had no way of knowing whether there was ground deformation occurring inside the crater, which, if present, would be a strong indication that magma was moving toward the surface. As a result, USGS-CVO's initial assessment of the swarm, which was formally released to the public as an Information Statement at 1600 Pacific Time on September 23 stating that, based on earthquake swarm characteristics alone, an eruption was not thought to be likely (Scott et al. 2008). However, when a continuous GPS station was installed in the crater on September 27, USGS-CVO had its first evidence that the crater floor was deforming at a substantial rate (LaHusen et al. 2008), making it clear that magma was involved. Had the crater GPS station been operating on September 23, it is very likely that USGS-CVO would have known several days earlier that the seismic swarm was a symptom of magma moving toward the surface. This, in turn, would have given Federal, State, and local officials several days of additional time to prepare for a possible eruption (the first explosion occurred October 1, just eight days after the start of unrest). Were this same scenario to have occurred at Glacier Peak instead, several days of response time would have been lost due to the uncertainty of whether the swarm was caused by magma movement or other causes, placing the public at increased risk of being in harm's way when the first explosions started to occur.

As this example illustrates, I believe that this monitoring network is critical to provide accurate and timely forecasts and early alerts of possible eruptive activity. We would use this monitoring data to help inform a coordinated response in the event of volcanic unrest. If the response relied only upon the monitoring sites outside of wilderness, then the delay in receiving critical information could put wilderness users at increased risk of danger. Having enough time to successfully remove possibly thousands of wilderness users (climb and/or hike out and then drive away) from the volcanic threat to safer locations is critical.

## **WILDERNESS ACT CONSISTENCY**

The importance of these actions does not negate my responsibility to comply with the Wilderness Act and to ensure minimal impact to the wilderness area. It is my responsibility to ensure that

these actions contribute to the administration of the area as wilderness. After reviewing the minimum requirements analysis and environmental assessment, I find that this project is fully consistent with the Wilderness Act, as explained in the EA, Sections 2-4, 2-5, and 3-4. The minimum requirements analysis for this project is available on the project website.

The following summarizes the steps taken by the Mt. Baker-Snoqualmie National Forest and USGS staff to develop a proposed action alternative that minimizes impacts to the wilderness area, while ensuring the health and safety of its users. More than 11,000<sup>1</sup> people visit Glacier Peak Wilderness each year:

1. We evaluated if these monitoring stations could be located outside of wilderness. It was determined that USGS has exhausted all non-wilderness options to monitoring volcanic activity and critical data gaps remain. Most volcanic earthquakes occur around the magma reservoir under the summit of the volcano and are quite small (magnitude 1.0). These smaller quakes would not be felt by a person standing directly above them, even if they occurred at a very shallow depth. The goal of the new monitoring stations is to detect the very small quakes that occur beneath the summit of the volcano during a volcanic eruption or prior to an eruption when magma is migrating toward the surface. These small quakes are also very difficult to detect and locate when the monitoring stations are more than three miles away from the summit. On the seismic side, USGS would not be able to capture or detect the needed data without placing the stations within the proposed distance. On the GPS side, there is only one existing GPS stations within four miles of the summit, which is too few in number to detect the very subtle ground deformation that would occur as the magma chamber inflates when new magma moves into the system. During the Mount St. Helens eruptions, only those monitoring stations closest to the crater detected subtle ground deformation occurring at the summit and in the crater; those monitoring stations at distances of six miles or greater showed little to no detectable deformation. These data are needed to help improve and protect public use and enjoyment of the wilderness area by ensuring that visitors remain safe. No other suitable locations are located outside of designated wilderness.
2. Once we determined that these monitoring stations could not be located outside of the wilderness area, we took a hard look at the number of monitoring stations required. Although USGS originally proposed six monitoring stations, it was ultimately determined that a minimum of four monitoring stations are needed to accurately locate volcanic earthquakes. The proposal would meet the minimum requirement for seismic monitoring, provide adequate station density and distribution as described in Moran et al. (2008a), and improve the ability to detect and locate very small earthquakes. As such, four stations are the absolute minimum number of stations necessary to functionally meet the purpose and need.
3. Then, we looked at the type of monitoring station to be installed to see if there was a temporary station or smaller station that could meet the needs. USGS uses temporary monitoring stations (spider volcanic monitoring stations) to conduct rapid monitoring

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<sup>1</sup> Visitation numbers were based on permit registrations from the Glacier Peak Wilderness permit boxes. Permits are only required May 15 to October 15, and the permits are completed by individuals entering the wilderness on an honor system. As such, these visitation numbers are likely low since people use the wilderness outside this time period and some users do not complete a permit. In addition, this average number does not account for the people accessing the Glacier Peak Wilderness from the east or those hiking the Pacific Crest Trail through Glacier Peak Wilderness. This is an average based on data collected from 2015 through 2017.

during an active volcanic eruption or landslide event. With some modifications, these stations could be used as temporary stations. These temporary monitoring stations, however, are not resistant to the harsh weather conditions found on Glacier Peak. These spiders are subject to being pushed and/deformed by snow loads. The GPS and telemetry antennas could easily be buried in the winter months. Once the equipment is covered in snow, the data are not transmitted to USGS for continuous analysis and interpretation, rendering early volcano warnings impossible. Most years, this would render volcano warnings impossible from approximately November through June. These stations are also only monitoring and allow for the identification of short-term trends in seismic behavior and ground deformation of the volcano. They are only capable of capturing large-scale ground deformations; they do not capture long-term, subtle ground deformations on the volcanic flanks. Temporary placement of seismic monitoring equipment, therefore, would not achieve the purpose of ongoing monitoring of earth movements. Also, this data would not provide the early warnings needed to ensure that visitors remain safe during volcanic unrest. Additional detail is provided in the minimum requirements analysis, which is available on the project website.

4. After determining that these stations need to be located within wilderness, as well as the minimum number and footprint of these stations, we ensured consistency with the Wilderness Act. The Wilderness Act requires that “each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character” (Section 4(b)). Each wilderness character is fully analyzed and discussed in the EA, Section 3.4, and in the minimum requirements analysis (available on the project website). The prohibited uses were carefully analyzed to ensure they were the minimal requirements necessary for the administration of the area as wilderness, as discussed in the EA, Section 2.4 and in the minimum requirements analysis. The impacts to wilderness character and the Wilderness Act prohibitions are briefly described below.

The qualities of wilderness character that are evaluated include: untrammeled, natural, undeveloped, opportunities for solitude or primitive and unconfined recreation, and other features of value. The installation of the monitoring stations would have negative impact on some of the qualities of wilderness character (see EA, Section 3.4); however, the proposed monitoring stations would have a positive impact on the safety of wilderness users during volcanic unrest. The impacts to the wilderness area, including ground disturbance, motorized equipment, and visual quality impacts, would be minimized as much as possible in order to preserve the wilderness character. The impacts were minimized based on the location and design of the monitoring stations, along with the required design features discussed previously. This project would impact approximately 150 square feet (less than 0.01 acre), which represents a very small fraction of the designated Glacier Peak Wilderness (566,156 acres). Visitors might be able to see the instruments, but views of the summit of Glacier Peak, the adjacent mountains, and the valleys below each site would remain visible.

This project does include the following prohibited uses: mechanical transport for installations (helicopter); motorized equipment for installation (battery-powered hand tools); and, installations (five monitoring stations). The installation of each monitoring site would require approximately five helicopter sling loads, 25 sling loads in total for installation. Batteries for the Seismic/GPS

Fiberglass Enclosure Stations would be replaced by helicopter sling loads every 3 to 5 years. Maintenance personnel would hike to all sites for battery replacement. The Wilderness Act prohibits motorized equipment, structures, installations, roads, commercial enterprises, aircraft landings, and mechanical transport “except as necessary to meet the minimum requirements for the administration of the area as wilderness” “including measures required in emergencies to meet the health and safety of persons within the area” (Section 4(c)).

Wilderness visitors and local communities are at risk from potential volcanic hazards such as pyroclastic flows and lahars during times of volcanic unrest. Unlike many other risks that wilderness visitors evaluate when traveling in wilderness, there is no way for wilderness visitors to independently evaluate the volcanic risk. Monitoring for volcanic hazards cannot be adequately accomplished without the use of installations, motorized equipment for installation, mechanical transport, and landing of aircraft within the wilderness area. These prohibited uses are discussed and analyzed in more detail in the minimum requirements analysis.

The Forest Service Manual (FSM) section 2326.1(5) states that motorized equipment and mechanical transport may be approved “to meet minimum needs for protection and administration of the area as wilderness.” This is an essential activity needed to improve and protect public use and enjoyment of the wilderness area by ensuring that visitors remain safe during volcanic unrest. The monitoring network would allow an early warning system to inform wilderness users. This activity “is impossible to accomplish by non-motorized means because of such factors as time or season limitations, safety, or other material restrictions” (FSM 2326.1(5)(b)).

The monitoring stations are too heavy to carry to the site via non-motorized means, including pack animals. The overall weight of the materials needed for installing each monitoring site is approximately 1,900 pounds. Non-motorized means of travel would be used for all maintenance work. After the initial installation, it is anticipated that the batteries would need to be replaced once every three to five years. Replacement batteries would flown to each site, personnel would be required to hike to each site for any maintenance needs.

Based on this information and the findings in the minimal requirements analysis (available on the project website), I find that the selected alternative is consistent with the Wilderness Act and is in the best interest of the wilderness users to ensure their health and safety.

## **OTHER ALTERNATIVES CONSIDERED**

In addition to the selected alternative, I considered four other alternatives: the no-action alternative and three alternatives that were considered but eliminated from detailed study. The three alternatives considered but eliminated from detailed study are: locating monitoring stations outside of wilderness, installing fewer monitoring stations in wilderness, and using temporary structures in wilderness. The no-action alternative is described in the EA, Section 2.1, and the alternatives considered but eliminated from detailed study are described in the EA, Section 2.5. The no-action alternative is described below, and the other alternatives considered are briefly described in the previous section.

### **No-action Alternative**

Under this alternative, no monitoring stations would be installed within three miles of the summit within the Glacier Peak Wilderness. Monitoring of volcanic activity at Glacier Peak

would be conducted at existing monitoring stations located outside of wilderness, and the Forest Service would not meet the recommendations provided by USGS (Moran et al. 2008a). Earthquake hypocenters that get shallower with time as magma moves closer to the summit prior to an eruption may be impossible to detect in real time using monitoring stations outside of wilderness.

Wilderness visitors and the surrounding communities would not have an adequate early warning system for Glacier Peak's volcanic activity as outlined in *Instrumentation Recommendations for Volcano Monitoring at U.S. Volcanoes Under the National Volcano Early Warning System, Scientific Investigations Report 2008–5114* (Moran et al. 2008a). The Forest Service would not provide for the safety of wilderness visitors, using the minimum requirements to administer the area as wilderness. More than 11,000 people visit the wilderness each year, including climbers.

## **PUBLIC INVOLVEMENT AND SCOPING**

As described previously, the need for this action arose to fill gaps in the monitoring network at Glacier Peak, after Glacier Peak was designated as a very high threat volcano by USGS. The proposal was provided to individuals and organizations, including local, State, tribal, and Federal governmental agencies; environmental groups; and local non-profit organizations during the scoping period, which ran from May 15 to June 13, 2015.

We received 12 scoping comments from Wilderness Watch, Snohomish County Fire District 21 Commissioner, and individuals. Ten of the twelve comments received were supportive of the proposal; however, Wilderness Watch raised wilderness character as an issue during the scoping period. Wilderness Watch, and others, are concerned because the monitoring equipment (structures) would be installed in wilderness and helicopters would be used for installation.

The proposal was provided to individuals and organizations, including local, State, tribal, and Federal governmental agencies; environmental groups; and local non-profit organizations during the comment period. A legal notice announcing the availability of the USGS Glacier Peak Seismic Monitoring Project in the Glacier Peak Wilderness was published in the *Everett Daily Herald* (newspaper of record) on July 20, 2018. The 30-day comment period ended on August 18, 2018.

We received 14 comments from Wilderness Watch, Snohomish County Executive, Washington State Emergency Management Division, North Cascades Conservation Council, Town of Darrington, and individuals. Eleven of the fourteen comments received were supportive of the project; however, Wilderness Watch, and others, reiterated their concerns that the monitoring equipment (structures) would be installed in wilderness and helicopters would be used for installation.

To address this issue, we considered three alternatives that would reduce the impact to wilderness character: (1) locating monitoring stations outside of wilderness; (2) installing fewer monitoring stations in wilderness; and (3) using temporary structures in wilderness. I considered these alternatives, but eliminated them from detailed study, as discussed in the EA, Section 2.5. This project also addressed this issue by minimizing the impacts to wilderness character as described in the description of the proposed action (EA, Section 2.2) and project design criteria and mitigation measures (EA, Section 2.3). Lastly, impacts to wilderness character are analyzed and disclosed in EA, Section 3.4.

## FINDING OF NO SIGNIFICANT IMPACT

As the responsible official, I am responsible for evaluating the effects of the project relative to the definition of significance established by the Council on Environmental Quality Regulations (40 CFR 1508.13). I have reviewed and considered the EA and documentation included in the project record, and I have determined that the proposed action would not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. My rationale for this finding follows, organized by sub-section of the Council on Environmental Quality definition of significance cited above.

### Context

For the proposed action, the context of the environmental effects is based on the environmental analysis in the EA. The overall long-term disturbance associated with these sites is summarized in **Error! Reference source not found..** This project would impact approximately 150 square feet (less than 0.01 acre), which represents a very small fraction of the designated Glacier Peak Wilderness (566,322 acres).

Table 3. Ground disturbance associated with USGS monitoring station designs

Type of Enclosure	Structure Dimensions (Feet) (L x W x H)	Long-term Impact Area (square feet)
Fiberglass Enclosure	5x5x5	30 (Includes GPS mast and seismometer buried in the ground.)

Additional ground disturbance would occur during installation; however, no trees or vegetation would be removed in these workstations. It is anticipated that an area of 100 to 500 square feet in the immediate vicinity of the monitoring stations would be needed to serve as a temporary workspace during installation. The impacts associated with these temporary workspaces would be very short-term. Once installation is completed, no additional temporary workspace would be needed for any of the maintenance visits.

As discussed in more detail below for the intensity factors of significance, the context of this project is limited to the project area. Even in a local context, this proposal would not pose significant short- or long-term effects, as described in chapter 3 of the EA and the associated specialist reports. The proposal's small scale limits its effects on the natural resource values and uses. The analysis of potential environmental impacts related to project activities demonstrates that no aspect of the proposal would result in any significant impacts. The proposal is a site-specific action that does not have international, national, regional, or statewide importance. The physical and biological effects of the selected actions were analyzed at appropriate scales.

### Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis of this EA and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained

from field visits. My finding of no significant impact is based on the context of the project and intensity of effects using the ten factors identified in 40 CFR 1508.27(b).

**1. Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on the balance the effects would be beneficial.**

Adverse and beneficial impacts have been assessed and were not found to be significant. The beneficial effects of the action do not bias my finding of no significant environmental effects. The analysis considered the direct and indirect effects of the projects as well as their contribution to cumulative effects. Past, present, and reasonably foreseeable future actions have been included in the analysis. Adverse effects from the selected alternative have been minimized or eliminated through project design criteria, BMPs, and mitigation measures. The selected alternative would have no effect on listed fish (EA, Section 3.1), botanical species (EA, Section 3.3), northern spotted owl (EA, Section 3.6), other wildlife species (EA, Section 3.6), or heritage resources (EA, Section 3.2). The impacts to wilderness character (EA, Section 3.4) were fully analyzed and the effects were found to be insignificant. Any adverse effects from the action would be minimal and localized. These actions are being undertaken to provide for long-term beneficial effects to health and safety through the implementation of the volcanic monitoring stations to inform wilderness users and surrounding communities of a potential hazard. As such, I find that the selected alternative is not a significant Federal action.

**2. The degree to which the proposed action affects public health or safety.**

I find that this project would benefit public health and safety by providing early volcanic warnings to wilderness users and surrounding communities. In order to increase safety preparedness, the primary purpose of the project is to install new monitoring stations at Glacier Peak to fill capability gaps in the existing volcanic monitoring network. Experience around the world has shown that having a good monitoring network in place before unrest begins at a volcano is critical for mitigating volcano hazards. Good monitoring networks help land managers and emergency officials mitigate volcanic hazards by allowing scientists to detect signs of unrest (e.g., increase in earthquakes, ground deformation, increase in gas output) earlier than would otherwise be possible. This in turn gives emergency officials more time to respond to the unrest and implement plans to protect wilderness users and adjacent communities.

This monitoring data would be used to help inform the coordinated response in the event of volcanic unrest. The coordinated response would follow the process outlined in the Mount Baker/Glacier Peak Coordination Plan (August 2012). The purpose of this plan is to coordinate the action that various agencies must take to minimize the loss of life and damage to property before, during, and after hazardous geologic events at the Glacier Peak volcano. Under this plan, one of the Forest Service responsibilities is to restrict access to hazard areas within the Glacier Peak National Forest, including wilderness. The USGS responsibilities include coordinating ash fall and lahar warning messages; issuing timely warning for potential geologic hazards to responsible emergency management authorities and to the public via alert level notification; and, monitoring volcanic unrest, tracking its development, forecasting eruptions, and evaluating the likely hazards. These are some of the responsibilities outlined in the plan that would help ensure the safety of wilderness users and the adjacent communities.

**3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.**

This project is located within the Glacier Peak Wilderness area. Consistency with the Wilderness Act is discussed in EA, Section 2.4 and the impacts to wilderness character is fully analyzed and discussed in the EA, Section 3.4. A minimum requirements analysis was completed for this project and is available on the project website. The “Rationale for this Decision” section outlines how this project is fully consistent with the Wilderness Act and maintains the qualities of wilderness character.

No direct, indirect, or cumulative effects to cultural resources are expected with implementation of the selected alternative (see EA, Section 3.2). No unique parklands, prime farmlands, wild and scenic rivers are located in the project area. This project has no effects to riparian areas or wetlands (see EA, Section 3.1).

**4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.**

The effects on the quality of the human environment are not likely to be highly controversial. While there may be some opposition to installing monitoring stations and using helicopters in the wilderness, I have concluded that the science behind seismic monitoring stations is not highly controversial based on my understanding and consultation with USGS technical experts. The science shows that these data cannot be collected outside of wilderness, as explained previously. This science was the basis for designating Glacier Peak as a very high threat volcano (Ewert et al. 2005). I have taken into account that opposition to the selected alternative has been fully considered through documentation of the no-action alternative and the alternatives considered but eliminated from detailed study in the EA (Sections 2.1 and 2.5) and the minimum requirements analysis (available on the project website).

**5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.**

There were no highly uncertain, unique or unknown risks identified in the selected alternative or its effects. The effects analyses discussed in Chapter 3 of the EA are based on sound scientific research. In fact, although the monitoring stations have a small footprint at 150 square feet, they would aid greatly in improving the scope of knowledge regarding volcanic activity and lend to reducing uncertainty around and threats posed from potential volcanic eruptions.

**6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

The action is not likely to establish a precedent for future actions with significant effects because this decision includes minimal effects on natural resources, including the qualities of wilderness character. Similar monitoring equipment has been installed outside and within wilderness areas on other national forests and national parks in the western United States. As such, this action is not unusual in and of itself, nor does it lead to any further actions. No additional monitoring stations are proposed in designated wilderness areas on the Mt. Baker-Snoqualmie National Forest.

**7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.**

The analysis considered not only the direct and indirect effects of the selected alternative with the project design criteria, BMPs, and mitigation measures, but also its contribution to cumulative effects. Past, present, and reasonably foreseeable future projects have been included

in the analysis (EA, Chapter 3). Each resource effects analysis contained in the EA discusses cumulative effects; none were found to be significant (EA, Section 3.1, Hydrology, Soils, and Fisheries; Section 3.2, Heritage; Section 3.3, Plants; Section 3.4, Recreation and Wilderness; Section 3.5, Visual Quality; Section 3.6, Wildlife; Section 3.7, Other Environmental Components). There were no cumulative effects identified in the effects analysis of the environmental assessment.

**8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in the National Register of Historic Places or may cause loss or destruction of significant cultural or historical resources.**

The action would have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places and would not cause loss or destruction of significant scientific, cultural, or historical resources. The overall disturbance associated with these five sites is negligible. Although new ground disturbance would occur, no known cultural resources would be impacted by this project. There is a very low probability that any undiscovered cultural sites are present at the proposed monitoring station locations. In compliance with Section 106 of the National Historic Preservation Act, the agency has conducted an assessment of adverse effects (36 CFR 800.5). The co-location of the sensor equipment at the lookout has the potential to affect the historical integrity of the lookout. Alterations to historical buildings can detract from the character and integrity to a degree that they are considered “adverse effects,” requiring mitigation through consultation with the State Historic Preservation Office (SHPO). The installation at Miner’s Ridge and attachment of the telemetry antenna to the lookout was determined to present no adverse effects to the historic property. State Historic Preservation Office concurred with this determination on May 1, 2017.

**9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act.**

The action complies with the Endangered Species Act for aquatic, botanical, and wildlife species. The anticipated effects and consistency determinations with the Endangered Species Act described in detail in the EA (Sections 3.1, 3.3, and 3.6) and summarized briefly below illustrate that the project would not adversely affect any endangered, threatened or proposed species, or the associated critical habitat.

There would be no effect to threatened, endangered, or proposed botanical species from the project as there are none present in the project area. There would be no effect to Endangered Species Act listed aquatic species or habitat, because there is no causal mechanism to affect the aquatic environment. No water or aquatic habitat is located at or near the monitoring stations. These sites are not within Riparian Reserves and are not near water; they are located on ridges or approximately one-quarter mile away from streams.

There is no habitat removal under the selected alternative; therefore, there is no effect to northern spotted owl habitat or owl designated critical habitat, and no effect to marbled murrelet habitat or murrelet designated critical habitat. The helicopter disruption distances for spotted owls and marbled murrelets is discussed in the programmatic biological opinion for forest management activities on the Mt. Baker-Snoqualmie National Forest (FWS Reference No. 1-3-02-F-1583). Noise disturbance was assessed as a Not Likely to Adversely Affect (NLAA) project for spotted owl and Likely to Adversely Affect (LAA) for marbled murrelets (USDA Forest Service and

USDI FWS 2002, 2010). To eliminate the potential for harm to spotted owl and marbled murrelets project design criteria is incorporated into the selected alternative, including the following:

The use of aircraft generating noise likely to exceed ambient levels within unsurveyed suitable or occupied marbled murrelet habitat will only occur 2 hours after sunrise to 2 hours before sunset between the dates of April 1 to September 23.

The effect determinations by adhering to the required project design criteria would be **Not Likely to Adversely Affect** to northern spotted owl and **Likely to Adversely Affect** (less than 1 acre) for marbled murrelet from disturbance.

Due to the lack of habitat removal under the selected alternative, there is no effect to grizzly bear or gray wolf habitat. Implementation of the project with helicopter installation of the monitoring equipment will have potential for a direct effect for short term displacement of animals at the installation sites. The presence of humans or helicopter flights could cause individuals to flee the area and avoid using the area during the transport and installation of the seismic monitoring equipment. This would be a short-term disturbance and would not result in harm to the individual or the species. An indirect effect to the species would be the monitoring equipment stations' presence in habitat. Experience from remote camera stations placed on Forest in carnivore studies suggest that wildlife habituated to new inanimate objects as evidenced by the fact that they do not avoid the remote camera stations used to record their presence. Therefore, given the large range of grizzly bear and gray wolves, lack of suitable forage at the sites, and carnivore response to inanimate objects, the risk effect determination for grizzly bear and gray wolf is May Effect, Not Likely to Adversely Affect (NLAA).

The effects to the northern spotted owl, marbled murrelet, designated critical habitat, grizzly bear and gray wolf for the project were assessed in a programmatic informal consultation submitted to the U.S. Fish and Wildlife Service (USFWS) in June of 2017. After Level One review, USFWS provided a notice of concurrence on June 13, 2017 that the USGS Glacier Peak Seismic Monitoring Project is consistent with the current Programmatic Consultation for Forest Activities between USFWS and the Mt. Baker-Snoqualmie National Forest (USFWS 2002) as extended and revised on December 18, 2007, and extended on March 23, 2010. (U.S. Fish and Wildlife Service. 2002. Biological Opinion of the Effects of Mt. Baker-Snoqualmie National Forest Program of Activities for 2003-2007 on Marbled Murrelet and Northern Spotted Owls. Western Washington Fish and Wildlife Office, Lacey, Washington. FWS Reference Number 1-3-02-F-1583.)

This project is also consistent with the Revised Northern Spotted Owl Recovery Plan (USFWS 2011), the Marbled Murrelet Recovery Plan (USFWS 1997) the Designation of Revised Critical Habitat for the Northern Spotted Owl, November 2012, and the Designation of Critical Habitat for the Marbled Murrelet ( USFWS 1996).

#### **10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.**

My decision will not violate Federal, State, and local laws or requirements for the protection of the environment. Applicable laws and regulations were considered in the EA (Sections 1.9 and 3.7). The action is consistent with the Forest Plan as described in the consistency section for each

resource in Chapter 3 of the EA. This project is consistent with the National Historic Preservation and Endangered Species Acts, as described above. It is also consistent with the National Forest Management Act and Wilderness Act, as described in the following section.

The project complies with Executive Order 12898 regarding environmental justice (EA, Section 3.7). No disproportionately high adverse human or environmental effects on minorities and/or low-income populations were identified during the analysis or public scoping process.

### **Conclusion**

After considering the environmental effects described in the EA and specialist reports, I have determined that the selected alternative (the proposed action) would not have significant effects on the quality of the human environment considering the context and intensity of impacts (40 CFR 1508.27). Thus, an environmental impact statement will not be prepared.

### **FINDINGS REQUIRED BY OTHER LAWS AND REGULATIONS**

I find that the selected alternative is consistent with all direction contained in the National Forest Management Act, National Environmental Policy Act, Council on Environmental Quality regulations, Wilderness Act, Clean Water Act, Endangered Species Act, and other applicable laws, policies and regulations.

#### **National Forest Management Act**

I find that the selected alternative is consistent with the National Forest Management Act, including the management direction found in the Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan, as amended (see EA, Section 1.9). This decision to install four new volcanic monitoring stations and one systems upgrade within the Glacier Peak Wilderness is consistent with the intent of the Mt. Baker-Snoqualmie Land and Resource Management Plan's long-term goals (listed on pages 4.1 to 4.8). Additionally, I find that the selected alternative is consistent with the major amendments to the Forest Plan, Northwest Forest Plan, and Invasive Plant Amendment, as described below. Lastly, I find that the selected alternative is consistent with the Forest Plan and regional direction on management indicator species and sensitive species as described below.

#### **Northwest Forest Plan**

##### *Survey and Manage Species*

I find that the selected alternative is consistent with the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (EA Section 3.6, Wildlife; Section 3.1, Fisheries; and Section 3.3, Plants), including all survey protocols. No habitat for wildlife or aquatic survey and manage species is present within the project area; therefore, no surveys or analysis is required.

##### *Aquatic Conservation Strategy*

I find that the selected alternative is consistent with the Aquatic Conservation Strategy. This project would have no impact on the nine Aquatic Conservation Strategy objectives (EA, Section 3.1) given the size of the project and proximity to Riparian Reserves. This project occurs outside the Riparian Reserves with no direct or indirect effects anticipated to water quality. Therefore, I find that the selected alternative is consistent with Riparian Reserve standards and guidelines and would not impact the fifth-field watersheds.

## **The Wilderness Act**

The Wilderness Act also governs the management actions proposed with this project. Congress enacted the Wilderness Act of 1964 to secure an enduring resource of wilderness for the enjoyment of present and future generations (Section 2(a)). Section 4(c) of the Wilderness Act states that: “except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.”

As discussed in the preceding “Rationale for this Decision” section, I find that this project is fully consistent with the Wilderness Act and is in the best interest of the wilderness users to ensure their health and safety. I also find that the selected alternative meets minimum requirements for administration of the area as wilderness. These monitoring stations are the minimum requirements needed; the minimum requirements analysis for installing and maintaining these stations has been completed and is available on the project website. The minimum requirements analysis is designed to assist the responsible official for this project in making appropriate decisions in wilderness. The minimum requirements analysis considered four alternatives: (1) no action – no monitoring stations within the Glacier Peak Wilderness; (2) personnel transported by helicopter to all sites; (3) no personnel would be delivered to any site by motorized transport; and (4) personnel transported by helicopter to the three remote sites.

## **ADMINISTRATIVE REVIEW AND OBJECTION RIGHTS**

On March 27, 2013, pre-decisional objection procedures became effective, which apply to project-level proposals not authorized under the Healthy Forests Restoration Act (36 CFR 218 Subparts A and B). The regulations provide an opportunity for individuals, organizations, and tribal entities to file an objection to a draft decision and seek higher-level review of unresolved concerns before the decision is finalized and signed. Issues to be raised in objections must be based on previously submitted specific written comments regarding the proposed project and attributed to the objector, unless the issue is based on new information that arose after a designated opportunity to comment (§218.8(c)). To maintain your right to file an objection, you are required to meet the eligibility requirements described in §218.5.

This draft decision is subject to administrative review (pre-decisional objection) pursuant to 36 CFR 218 Subparts A and B. An objection must meet all of the requirements described in 36 CFR 218.8.

### *Who may file an objection (36 CFR 218.5)*

Only individuals or organizations that submitted specific written comments during any designated opportunity for public participation (scoping or public comment periods) may object.

### *Filing an objection (36 CFR 218.8)*

An objection must meet all of the requirements described in 36 CFR 218.8, which include being in writing and being filed with the reviewing officer.

### *Incorporation of documents by reference [36 CFR 218.8 (b)]*

Incorporation of documents by reference is not allowed, except for the following list of items that may be referenced by including date, page, and section of the cited document, along with a

description of its content and applicability to the objection. All other documents must be included with the objection.

*Objection issues [36 CFR 218.8(c)]*

Issues raised in objections must be based on previously submitted specific written comments regarding the proposed project or activity and attributed to the objector, unless the issue is based on new information that arose after the opportunities for comment. The burden is on the objector to demonstrate compliance with this requirement for objection issues.

*Minimum requirements [36 CFR 218.8(d)]*

At a minimum, an objection must include the following:

- (1) Objector's name and address as defined in § 218.2, with a telephone number, if available;
- (2) Signature or other verification of authorship upon request (a scanned signature for electronic mail may be filed with the objection);
- (3) When multiple names are listed on an objection, identification of the lead objector as defined in § 218.2. Verification of the identity of the lead objector must be provided upon request or the reviewing officer would designate a lead objector as provided in § 218.5(d);
- (4) The name of the proposed project, the name and title of the responsible official, and the name(s) of the national forest(s) and/or ranger district(s) on which the proposed project would be implemented;
- (5) A description of those aspects of the proposed project addressed by the objection, including specific issues related to the proposed project; if applicable, how the objector believes the environmental analysis or draft decision specifically violates law, regulation, or policy; suggested remedies that would resolve the objection; supporting reasons for the reviewing officer to consider; and
- (6) A statement that demonstrates the connection between prior specific written comments on the particular proposed project or activity and the content of the objection, unless the objection concerns an issue that arose after the designated opportunity(ies) for comment (see paragraph (c) of this section).

*Timely filing (36 CFR 218.9):*

Evidence of and responsibility for timely filing is described in §218.9. Objections must be postmarked or received by the Reviewing Officer, Regional Forester, within 45 days from the date of publication of notice of the objection in the *Everett Daily Herald*, the newspaper of record for the Mt. Baker-Snoqualmie National Forest. The publication date is the exclusive means for calculating the time to file an objection. Those wishing to file an objection should not rely upon dates or timeframe information provided by any other source.

*Mail:* Objections can be mailed to the Reviewing Officer at the address below. **At this time, the building is closed therefore, those who wish to send an objection via hardcopy mail must contact Debbie Anderson at (503)808-2286 or [debbie.anderson2@usda.gov](mailto:debbie.anderson2@usda.gov) to ensure their objections is received.** Objections delivered by mail must be postmarked no later than the last day of the 45-day objection filing period.

Regional Forester (Reviewing Officer)  
Pacific Northwest Regional Office  
Attn: Objections  
P.O. Box 3623  
Portland, OR 97208-3623

*Electronic:* Electronic submissions are preferred and may be submitted by completing the form available online at: <https://cara.ecosystem-management.org/Public/CommentInput?Project=46957>. The objection filing form can also be accessed by clicking on the “Comment/Object on Project” link on the right sidebar of the project website.

*Hand-delivery:* **Also, due to the building closure, those submitting hand-delivered objections must contact Debbie Anderson at (503)808-2286 or [debbie.anderson2@usda.gov](mailto:debbie.anderson2@usda.gov), in advance to make an appointment.** Objections can be hand delivered to the Pacific Northwest Regional Office, 1220 SW 3<sup>rd</sup> Avenue, Portland, Oregon.

*Fax:* **While the building is closed due to the Oregon Governor’s Executive Order, those who wish to fax an objection must contact Debbie Anderson at (503)808-2286 or [debbie.anderson2@usda.gov](mailto:debbie.anderson2@usda.gov) to ensure their objection is received.** Objections can be faxed to the Regional Forester, Attn: Objections at (503) 808-2339. Please verify receipt.

## IMPLEMENTATION

If no objection is filed, a decision would be made and implementation may begin on, but not before, the 5<sup>th</sup> business day following the close of the 45-day objection period. If an objection is filed, implementation may occur immediately following the issuance of a final decision.

## CONTACT

For additional information, contact Todd Griffin, Interdisciplinary Team Leader at [todd.griffin@usda.gov](mailto:todd.griffin@usda.gov); or Benjamin Pauk at USGS-CVO at [bpauk@usgs.gov](mailto:bpauk@usgs.gov) during normal business hours.

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JODY WEIL  
Forest Supervisor  
Mt. Baker-Snoqualmie National Forest

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Date

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**End of Document**